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November 20, 2000

Box PATENT APPLICATION  
Commissioner for Patents  
Washington, D.C. 20231

Re: New U.S. Patent Applm.  
Our Ref: 951/49289

Sir:

Transmitted herewith for filing is the patent application of:

**Hermann KUENZNER**

entitled: **PROCESS AND DEVICE FOR VISUAL DISPLAY OF INFORMATION  
IN MOTOR VEHICLES**

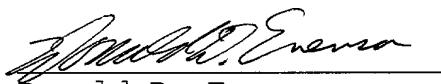
Enclosed are:

1. Specification, including 8 claims (1-12 pages).
2. 1 Sheet of X Formal drawings showing Figs. 1-3.
3. X Preliminary Amendment
4. X Declaration and Power of Attorney (**executed**).
5. Assignment of the invention to Bayerische Motoren Werke Aktiengesellschaft w/Form PTO-1595.
6. Certified copy of Priority Document 199 59 597.6 filed in Germany on December 10, 1999, the priority of which is being claimed under 35 U.S.C. §119 and 37 C.F.R. §1.55.
7. X Information Disclosure Statement w/1 reference.
8. The filing fee has been calculated as shown below:

Basic Fee				\$355/710 =	\$710.00
Total Claims	<u>8</u>	- 20 =		x \$ 9/18 =	\$
Independent Claims	<u>2</u>	- 3 =		x \$40/80 =	\$
Multiple Dependent Claim Presented				\$135/270 =	\$
Total Filing Fee					<u>\$710.00</u>

Two checks in the amount of \$710.00 for the filing fee and \$40.00 for the assignment recording fee are enclosed. The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment, to Deposit Account No. 05-1323 (Docket #951/49289). A duplicate copy of this sheet is enclosed.

Respectfully submitted,

  
Donald D. Evenson  
Reg. No. 26,160

DDE:mkh

Attorney Docket: 951/49289  
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: HERMANN KUENZNER

Serial No.: Group Art Unit:

Filed: Examiner:

Title: PROCESS AND DEVICE FOR VISUAL DISPLAY OF INFORMATION IN  
MOTOR VEHICLES

PRELIMINARY AMENDMENT

Box PATENT APPLICATION  
Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to examination, please preliminarily amend the above-identified application to correct typographical errors as follows:

IN THE CLAIMS:


Claim 1, lines 5-6, change "wherein the information is" to  
-- wherein the sets of information are --.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #951/49289).

Respectfully submitted,

November 20, 2000



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

SPECIFICATION

INVENTION:

PROCESS AND DEVICE FOR VISUAL DISPLAY OF  
INFORMATION IN MOTOR VEHICLES

INVENTOR:

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PROCESS AND DEVICE FOR VISUAL DISPLAY  
OF INFORMATION IN MOTOR VEHICLES

BACKGROUND AND SUMMARY OF THE INVENTION

This application claims the priority of 199 59 597.6, filed in Germany, December 12, 1999, the disclosure of which is expressly incorporated by reference herein.

The invention relates to a process and a device for visual display of information in motor vehicles with an electronically controllable display, where the display is controlled in such a manner that at least two sets of information, having an interrelated effect, are displayed as a comparison by graphical representation, wherein the information is displayed at the same place alternating with the same type of graphics, but with different labels.

Such a process and such a device are known, for example, from the German Patent Document DE 39 36 373 A1. In this case, the information pairs -- fuel supply and current usage or fuel supply and range -- are placed opposite each other simultaneously

in a single display in the sense of generating a difference. Of course, the result of this simultaneous, comparison display of at least two sets of information having an interrelated effect is a synergetic effect, which allows the driver to conclude from the mere listing of information additional information, but it is possible for too much information to appear in too little space.

Furthermore, past instrument combinations (also so-called instrument clusters or indicating panels) in the area of the dashboard in motor vehicles simultaneously indicate information, such as revolutions, speed, consumption, tank content, range, etc., either with a pointer or a display. If a display is used, diverse information of the car computer can be displayed in sequence, especially in connection with a car computer, by actuating an operating element, such as a pressure switch. In so doing, the information is displayed one at a time, only upon manual query, according to a defined order of sequence without any contextual order, usually in text.

An object of the invention is to improve a process and a device of the aforementioned class with respect to ergonomic requirements. In particular, the driver is supposed to be as well informed as possible about his car, on the one hand, but not

overstrained by too much information in too little space, on the other hand.

This object is achieved according to preferred embodiments of the invention by providing a process and/or device for visual display of information in motor vehicles with an electronically controllable display, where the display is controlled in such a manner that at least two sets of information, having an interrelated effect, are displayed as a comparison by graphical representation, wherein the information is displayed at the same place alternating with the same type of graphics, but with different labels.

Other features and improvements of the invention are described below and in the claims.

With the inventive process and the inventive indicator, which contains an electronic controller and a display, which is controlled electronically by the controller, the display is controlled in such a manner automatically or manually by the controller that at least two sets of information, having an interrelated effect, are displayed as a comparison by graphical representation. In this respect the information is displayed at the same place alternating with the same graphics, i.e. with the

same type of representation, but with a different label. The graphics appears at the same place in the display. The change takes place, for example, in defined time segments or by actuating a control switch per user request.

Examples of information having an interrelated effect are the value pairs -- range/distance, current fuel consumption/average fuel consumption, tank content/range, total travel time/time traveled.

In addition, other information can be simultaneously displayed (e.g. below or inside the graphical representation of the alternately displayed information).

Preferably the information is displayed with a bar graph.

The diverse information can be displayed in different colors or intensity of illumination (light/dark).

Owing to the comparison display of two or more sets of information having interrelated effect, the driver can see very quickly at first glance additional information, such as "tank content is adequate for the total travel time" or "in this driving style the average fuel consumption will increase". Thus,

the driver's concentration is diverted as little as possible from the driving. The alternating display of the information gives a better overview of the display. Since the information exhibits an interrelated effect, the driver can easily follow the alternately displayed information and grasp its meaning.

Other objects, advantages and novel features of the present invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an alternating comparison display of information, according to the invention, using as examples the information tank content and range;

Figure 2 is an alternating comparison display of information, according to the invention, using as examples the information range and distance; and

Figure 3 is an alternating comparison display of information, according to the invention, using as examples the



information current fuel consumption and average fuel consumption.

DETAILED DESCRIPTION OF THE DRAWINGS

In addition, reference is made to the fact that the comparison display of information is not limited to the display of only two sets of information.

In Figure 1 the information tank content (tank) and range is displayed alternately one above the other at the same place of a display 1. An alternating display can be time-controlled, for example, every 5 seconds, or manually, for example, by actuating a control switch according to the user's request. In so doing, a display in the instrument cluster can be enabled with a control switch, which is to be actuated in the axial direction and is located on the pitman drop arm. Thus, actuating the control switch results in a different labeling of the tank content bar (in liters or in kilometers). At the same time the same graphics, namely a dark bar on a light background, is used with a different label of information and its units (liters (l) or km). Such a representation is especially advantageous with a very narrow display. In the illustrated example, the tank content is shown once in the form of a bar with the labeling of the

actual tank content in liters and once the range with the labeling of the actual range in km. Since the length of the bar cannot change when the display changes, the display of the tank content is quasi continuous.

According to Figure 2, the two sets of information range and distance, which have an interrelated effect based on fuel consumption, are displayed alternately with bar graphs at the same place on a display 1. The range indicates how many kilometers the vehicle can still travel with the current tank content at approximately constant driving style or fuel consumption without refueling. The distance indicates how many kilometers still remain until the entered destination. Prerequisite is, for example, a car computer or a navigation system. In addition, the bar for representing the range is brighter than the bar for representing the distance. Owing to the varying intensity of illumination the distance is especially highlighted as the more important of the two sets of information. In the present case there is enough fuel in the tank to reach the destination, if the driving style and/or the fuel consumption remains approximately the same. The driver understands this additional information by one brief glance at the indicator of the invention without having to make any numerical considerations.

Figure 3 depicts, according to the invention, another possible representation using the information current fuel consumption and average fuel consumption as an example. The current fuel consumption is indicated by the dark narrow bar; the average fuel consumption, by the lighter wide bar. In so doing, the alternating frequency can be increased so much, as desired, that the eye perceives a simultaneous representation of both sets of information. If at the same place the dark narrow bar emerges, like an arrow, out of the light bar, during fast alternating representation of both sets of information, the result is that the driver sees at a glance the additional information that if he maintains the current driving style the average fuel consumption will increase in the long run and thus the range will decrease.

With a time limit or a reset button the recalculation of the information and/or the values, e.g. at the beginning of the trip, can be started. In this respect a reset of the individual values or a general reset of all relevant values for a trip is conceivable.

The foregoing disclosure has been set forth merely to illustrate the invention and is not intended to be limiting. Since modifications of the disclosed embodiments incorporating

the spirit and substance of the invention may occur to persons skilled in the art, the invention should be construed to include everything within the scope of the appended claims and equivalents thereof.

WHAT IS CLAIMED:

1. Process for visual display of information in motor vehicles with an electronically controllable display, where the display is controlled in such a manner that at least two sets of information, having an interrelated effect, are displayed as a comparison by graphical representation, wherein the information <sup>are</sup> is displayed at the same place alternating with the same type of graphics, but with different labels.

2. Process as claimed in patent claim 1, wherein the information is displayed with a bar graph.

3. Process as claimed in claim 1, wherein the information is displayed in different colors or intensity of illumination (light/dark).

4. Process as claimed in claim 2, wherein the information is displayed in different colors or intensity of illumination (light/dark).

5. Indicator for visual display of information in motor vehicles with an electronically controllable display, where there are means to control the display in such a manner that at least two sets of information, having an interrelated effect, are displayed as a comparison by graphical representation, wherein the information is displayed at the same place alternating with the same type of graphics, but with different labels.

6. Indicator as claimed in claim 5, wherein the information is displayed with a bar graph.

7. Indicator as claimed in claim 5, wherein the information is displayed in different colors or intensity of illumination (light/dark).

8. Indicator as claimed in claim 6, wherein the information is displayed in different colors or intensity of illumination (light/dark).

**ABSTRACT OF THE DISCLOSURE**

In a process and device for visual display of information in motor vehicles with an electronically controllable display, the display is controlled in such a manner that at least two sets of information, having an interrelated effect, are displayed as a comparison by graphical representation. Examples of information having an interrelated effect are the value pairs - range/distance, current fuel consumption/average fuel consumption, tank content/range, total travel time/time traveled. In this respect the information is displayed at the same place alternating with the same type of graphics, but with different labels.

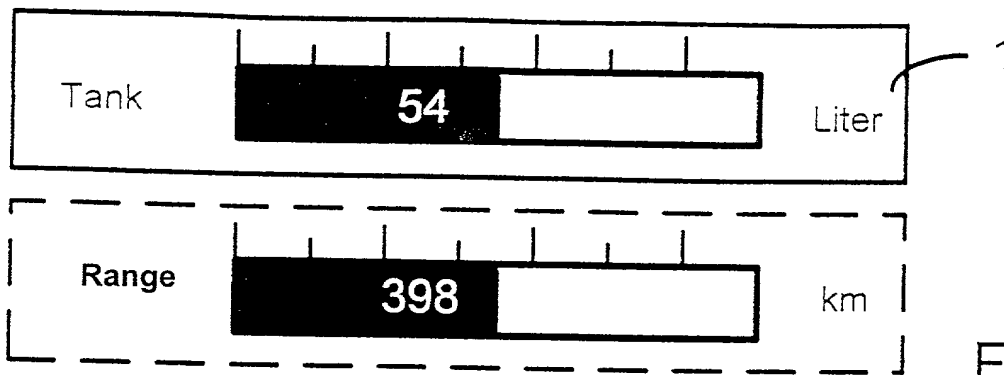


Fig. 1

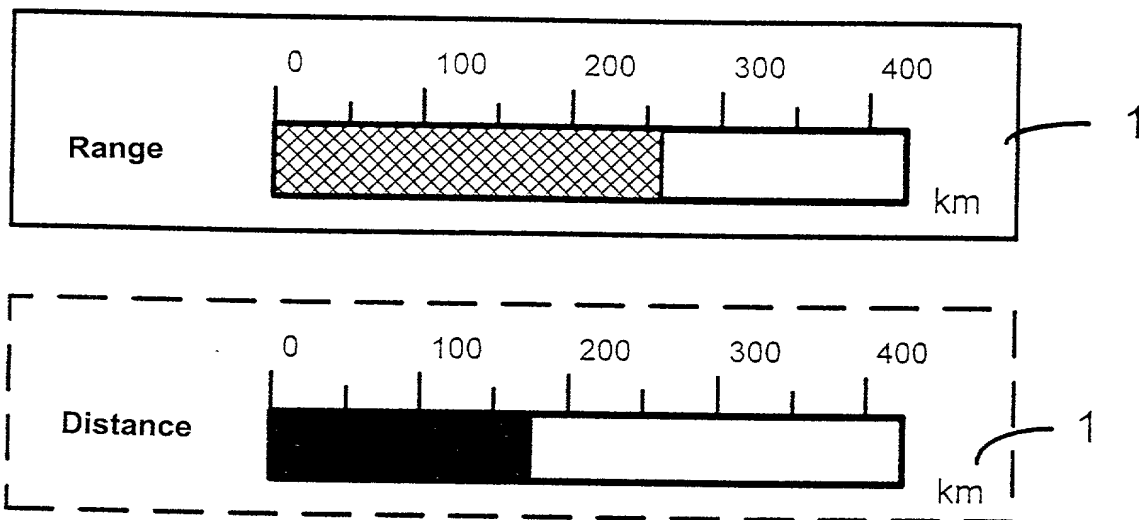


Fig. 2

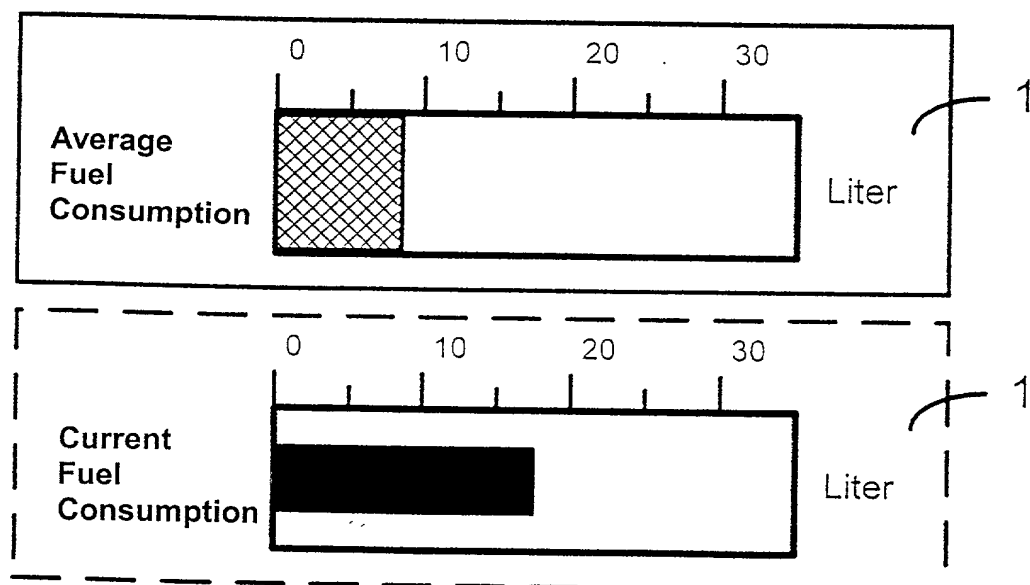


Fig. 3



## DECLARATION AND POWER OF ATTORNEY - PATENT APPLICATION

As a below named inventor, I hereby declare that my citizenship, postal address and residence are as stated below; that I verily believe I am the original, first and sole inventor (if only one inventor is named below) or a joint inventor (if plural inventors are named below) of the invention entitled:

# PROCESS AND DEVICE FOR VISUAL DISPLAY OF INFORMATION IN MOTOR VEHICLES

the specification of which

    X     is attached hereto, or  
         was filed on \_\_\_\_\_ as Application Serial No. \_\_\_\_\_ and  
         was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose all information known to be material to patentability as defined in 37 CFR §1.56. I hereby claim foreign priority benefits under Title 35, United States Code §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Priority Claimed

<u>99 59 597.6</u>	<u>Germany</u>	<u>10 December, 1999</u>	<u>Yes</u>
(Number)	(Country)	(Day/Month/Year)	

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose all information known to be material to patentability as defined in 37 CFR §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)

(Filing Date)

(Status)

I hereby appoint as principal attorneys Herbert I. Cantor, Reg. No. 24,392; James F. McKeown, Reg. No. 25,406; Donald D. Evenson, Reg. No. 26,160; Joseph D. Evans, Reg. No. 26,269; Gary R. Edwards, Reg. No. 31,824; and Jeffrey D. Sanok, Reg. No. 32,169, to prosecute and transact all business in the Patent and Trademark Office connected with this application and any related United States and international applications. Please direct all communications to:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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7.11.2000

(date)

Germany  
Hermann Kün

(signature of 1st inventor)